

CLAIMS

What is claimed is:

1. A method of recalibrating a Global Positioning System (GPS) receiver, the method comprising the steps of:

applying a first control signal to an oscillator of the GPS receiver for generation of an oscillator output signal having an initial frequency;

determining whether at least one indicator of a substantially correct oscillator output frequency is present in the GPS receiver with said oscillator output signal having said initial frequency; and

if said at least one indicator of a substantially correct oscillator output frequency is not present in the GPS receiver with said oscillator output signal having said initial frequency, then iteratively performing the following steps until said at least one indicator of a substantially correct oscillator output frequency is present in the GPS receiver:

applying an adjusted control signal to said oscillator of the GPS receiver other than said first control signal and said adjusted control signal of a previous iteration for generation of said oscillator output signal having an adjusted frequency other than said initial frequency and said adjusted frequency of any previous iteration;

determining whether at least one indicator of a substantially correct oscillator output frequency is present in the GPS receiver with said oscillator output signal having said adjusted frequency other than said initial frequency and said adjusted frequency of said previous iteration; and

if said at least one indicator of a substantially correct oscillator output frequency is present in the GPS receiver with said oscillator output signal having said adjusted frequency other than said initial frequency and said adjusted frequency of said previous iteration, storing said adjusted control signal applied to said oscillator for generation of said oscillator output signal with said adjusted frequency; and

if said at least one indicator of a substantially correct oscillator output frequency is present in the GPS receiver with said oscillator output signal having said initial frequency, then storing said initial control signal applied to said oscillator for generation of said oscillator output signal with said initial frequency.

2. The method of recalibrating the GPS receiver of claim 1, wherein said indicator of a substantially correct oscillator output frequency comprises acquisition of at least one GPS satellite signal.

3. The method of recalibrating the GPS receiver of claim 2, further comprising the step of discontinuing, after performing a predetermined number of iterations, the step of iteratively performing the following steps until said at least one GPS satellite signal is at least substantially acquired by the GPS receiver.

4. The method of recalibrating the GPS receiver of claim 2, further comprising the step of discontinuing, after expiration of a predetermined period, performance of the step of iteratively performing the following steps until said at least one GPS satellite signal is at least substantially acquired by the GPS receiver.

5. The method of recalibrating the GPS receiver of claim 2, wherein said at least one GPS satellite signal is a multi-dimensional position fix.

6. The method of recalibrating the GPS receiver of claim 1, further comprising the step of selecting said first control signal, said adjusted control signal, and said adjusted control signal other than said first control signal and said adjusted control signal of said previous iteration from a predetermined sequence of control signals.

7. The method of recalibrating the GPS receiver of claim 6, wherein said predetermined sequence of control signals comprises said first control signal and a plurality of control signals offset from said first control signal by a predetermined offset.

8. The method of recalibrating the GPS receiver of claim 1, wherein said first control signal is based at least partially on a control signal selected during a previous calibration of the GPS receiver.

9. The method of recalibrating the GPS receiver of claim 1, wherein said step of applying a first control signal to said oscillator of the GPS receiver for generation of said oscillator output signal having said initial frequency is initiated without human intervention in response to a failure of the GPS receiver to acquire at least one GPS satellite signal within a predetermined period.

10. The method of recalibrating the GPS receiver of claim 1, further comprising the steps of:

discontinuing a core GPS process of the GPS receiver prior to said selecting said first control signal, said adjusted control signal, and said adjusted control signal other than said first control signal and said adjusted control signal of said previous iteration from a predetermined sequence of control signals; and

initiating said core GPS process of the GPS receiver after said selecting said first control signal, said adjusted control signal, and said adjusted control signal other than said first control signal and said adjusted control signal of said previous iteration from a predetermined sequence of control signals

11. The method of recalibrating the GPS receiver of claim 1, wherein said at least one indicator of a substantially correct oscillator output frequency comprises a signal detected in said mixer.

12. The method of recalibrating the GPS receiver of claim 1, wherein said at least one indicator of a substantially correct oscillator output frequency comprises a signal detected in said oscillator.

13. A GPS receiver, comprising:

an oscillator configured to generate an oscillator output signal;

a mixer that is configured to receive an RF signal and convert said RF signal to at least one acquired GPS satellite signal with an application of said oscillator output signal; and

a controller coupled to said oscillator and to said mixer, said controller configured to:

apply a first control signal to said oscillator for generation of said oscillator output signal with an initial frequency;

detect for at least one indicator of a substantially correct oscillator output signal during generation of said initial frequency; and

if said at least one indicator of a substantially correct oscillator output frequency is not at least substantially detected with said oscillator output signal having said initial frequency, then iteratively perform the following steps until said at least one indicator of a substantially correct oscillator output frequency is at least substantially detected in the GPS receiver:

apply an adjusted control signal to said oscillator of the GPS receiver other than said first control signal and other than said adjusted control signal of a previous iteration for generation of said oscillator output signal with an adjusted frequency other than said initial frequency and other than said adjusted frequency of said previous iteration;

determine whether said at least one indicator of a substantially correct oscillator output frequency is at least substantially detected with said oscillator output signal having said adjusted frequency other than said initial frequency and other than said adjusted frequency of said previous iteration; and

if said at least one indicator of a substantially correct oscillator output frequency is at least substantially detected with said oscillator output signal having said adjusted frequency other than said initial frequency and other than said adjusted frequency of said previous iteration, store said adjusted control signal applied to said oscillator for generation of said oscillator output signal with said adjusted frequency; and

if said at least one indicator of a substantially correct oscillator output frequency is at least substantially detected with said oscillator output signal having said initial frequency, store said initial control signal applied to said oscillator for generation of said oscillator output signal with said initial frequency.

14. The GPS receiver of claim 13, wherein said indicator of a substantially correct oscillator output frequency comprises acquisition of at least one GPS satellite signal.

15. The GPS receiver of claim 14, wherein said controller is further configured to discontinue, after a predetermined number of iterations, the step to iteratively perform the following steps until said at least one GPS satellite signal is at least substantially acquired by the GPS receiver.

16. The GPS receiver of claim 14, wherein said controller is further configured to discontinue, after expiration of a predetermined period, the step to iteratively perform the following steps until said at least one GPS satellite signal is at least substantially acquired by the GPS receiver.

17. The GPS receiver of claim 14, wherein said at least one GPS satellite signal is a multi-dimensional position fix.

18. The GPS receiver of claim 13, wherein said controller is further configured to select said first control signal, said adjusted control signal, and said adjusted control signal other than said first control signal and said adjusted control signal of said previous iteration from a predetermined sequence of control signals.

19. The GPS receiver of claim 18, wherein said predetermined sequence of control signals comprises said first control signal and a plurality of control signals offset from said first control signal by a predetermined offset.

20. The GPS receiver of claim 13, wherein said controller is configured to select said first control signal based at least partially on a control signal selected during a previous calibration of the GPS receiver.

21. The GPS receiver of claim 13, wherein said controller is configured to initiate application of said first control signal to said oscillator of the GPS receiver for generation of said oscillator output signal having said initial frequency without human intervention in response to a failure of the GPS receiver to acquire at least one GPS satellite signal.

22. A program product for a GPS receiver having a processor, the program product comprising:

recalibration software executable in the processor to:

apply a first control signal to an oscillator of the GPS receiver for generation of an oscillator output signal having an initial frequency;

detecting for at least one indicator of a substantially correct oscillator output frequency is present in the GPS receiver with said oscillator output signal having said initial frequency; and

if said at least one indicator of a substantially correct oscillator output frequency is not at least substantially detected by the GPS receiver with said oscillator output signal having said initial frequency, then iteratively perform the following steps until said at least one indicator of a substantially correct oscillator output frequency is at least substantially detected by the GPS receiver:

apply an adjusted control signal to said oscillator of the GPS receiver other than said first control signal and said adjusted control signal of a previous iteration for generation of said oscillator output signal having an adjusted frequency other than said initial frequency and said adjusted frequency of said previous iteration;

determine whether at least one indicator of a substantially correct oscillator output frequency is at least substantially detected by the GPS receiver with said oscillator output signal having said adjusted frequency other than said initial frequency and said adjusted frequency of said previous iteration; and

if said at least one indicator of a substantially correct oscillator output frequency is at least substantially detected by the GPS receiver with said oscillator output signal having said adjusted other than said initial frequency and said adjusted frequency of said previous iteration, store said adjusted control signal applied to said oscillator for generation of said oscillator output signal with said adjusted frequency; and

if said at least one indicator of a substantially correct oscillator output frequency is at least substantially detected by the GPS receiver with said oscillator output signal having said initial frequency, then store said initial control signal applied to said oscillator for generation of said oscillator output signal with said initial frequency; and

signal-bearing media bearing said recalibration software.

23. The program product for the GPS receiver having the processor of claim 22, wherein said at least one indicator of a substantially correct oscillator output frequency comprises acquisition of at least one GPS satellite signal.

24. The program product for the GPS receiver having the processor of claim 28, wherein said recalibration software is further executable in the processor to discontinue, after a predetermined number of iterations; said step to iteratively perform the following steps until said at least one indicator of a substantially correct oscillator output frequency is at least substantially detected by the GPS receiver.

25. The program product for the GPS receiver having the processor of claim 28, wherein said recalibration software is further executable in the processor to discontinue, after expiration of a predetermined period, said step to iteratively perform the following steps until said at least one GPS satellite signal is at least substantially acquired by the GPS receiver.

26. The program product for the GPS receiver having the processor of claim 28, wherein said at least one GPS satellite signal is a multi-dimensional position fix.

27. The program product for the GPS receiver having the processor of claim 22, wherein said recalibration software is further executable in the processor to select said first control signal, said adjusted control signal, and said adjusted control signal other than said first control signal and said adjusted control signal of said previous iteration from a predetermined sequence of control signals.

28. The program product for the GPS receiver having the processor of claim 22, wherein said predetermined sequence of control signals comprises said first control signal and a plurality of control signals offset from said first control signal by a predetermined offset.

29. The program product for the GPS receiver having the processor of claim 22, wherein said first control signal is based at least partially on a control signal selected during a previous calibration of the GPS receiver.



30. The program product for the GPS receiver having the processor of claim 22, wherein said recalibration software is further executable in the processor to initiate application of said first control signal to said oscillator of the GPS receiver for generation of said oscillator output signal having said initial frequency without human intervention in response to a failure of the GPS receiver to acquire said at least one GPS satellite signal.

31. The program product of claim 22, wherein said signal-bearing media comprises transmission media.

32. The program product of claim 22, wherein said signal-bearing media comprises recordable media.

33. A method of reconfiguring a GPS receiver for recalibration, comprising the steps of:

uploading a program into a memory of the GPS receiver that is executable by a processor of the GPS receiver; said program comprising:

recalibration software executable in the processor to:

apply a first control signal to an oscillator of the GPS receiver for generation of an oscillator output signal having an initial frequency;

detect for at least one indicator of a substantially correct oscillator output frequency in the GPS receiver with said oscillator output signal having said initial frequency; and

if said at least one indicator of a substantially correct oscillator output frequency is not at least substantially detected in the GPS receiver with said oscillator output signal having said initial frequency, then iteratively perform the following steps until said at least one indicator of a substantially correct oscillator output frequency is at least substantially detected in the GPS receiver:

apply an adjusted control signal to said oscillator of the GPS other than said first control signal and said adjusted control signal of a previous iteration for generation said oscillator output signal having an adjusted frequency other than said initial frequency and said adjusted frequency of said previous iteration;

determine whether at least one indicator of a substantially correct oscillator output frequency is at least substantially detected in the GPS receiver with said oscillator output signal having said adjusted frequency other than said initial frequency and said adjusted frequency of said previous iteration; and

if said at least one indicator of a substantially correct oscillator output frequency is at least substantially detected in the GPS receiver with said oscillator output signal having said adjusted other than said initial frequency and said adjusted frequency of said previous iteration, store said adjusted control signal applied to said oscillator for generation of said oscillator output signal with said adjusted frequency; and

if said at least one indicator of a substantially correct oscillator output frequency is at least substantially detected in the GPS receiver with said oscillator output signal having said initial frequency, then store said initial control signal applied to said oscillator for generation of said oscillator output signal with said initial frequency; and

said program uploaded from signal-bearing media bearing said recalibration software; and

uploading field calibration data into said memory of the GPS receiver that is accessed by said processor during execution of said program by said processor of the GPS receiver.

34. The method of reconfiguring a GPS receiver for recalibration of claim 33, wherein said indicator of a substantially correct oscillator output frequency comprises acquisition of a GPS satellite signal.